REMARKS

Claims 27-35 are pending in the application. Claims 1-26 and 36-40 have been canceled without prejudice, and claims 27, 29, and 30 have been amended. Support for the amendments can be found in the specification at, e.g., page 4, lines 20-24. These amendments add no new matter.

35 U.S.C. §112, Second Paragraph (Indefiniteness)

At pages 2-3 of the Office Action, the Examiner rejected claim 27 as allegedly indefinite "because the claim does not set forth the materials and method steps that result in the activation of the human T cells." Claim 27 has been amended to require that a CYP1B1 sequence (such as a CYP1B1 amino acid sequence or nucleic acid sequence) be administered to a subject so as to result in the activation of T cells. In view of this amendment, applicants request that the Examiner withdraw the rejection.

At page 3 of the Office Action, the Examiner rejected claims 29 and 30 as allegedly indefinite in that "the instant claims do not set forth a nexus between claim 28 and the instant claims such that it is clear that the activation of cytotoxic T cells (claim 29) and helper T cells (claim 30) is achieved by immunizing with a human CYP1B1 epitope." Claims 29 and 30 have been amended to require that immunizing with the human CYP1B1 amino acid sequence results in the activation of cytotoxic T cells (claim 29) or helper T cells (claim 30). In view of these amendments, applicants request that the Examiner withdraw the rejections.

35 U.S.C. §112, First Paragraph (Written Description)

At pages 4-6 of the Office Action, the Examiner rejected claims 27-35 as allegedly containing subject mater that was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventor, at the time the application was filed, had possession of the claimed invention. According to the Examiner,

> [a]s written, claim 27 is very broad and encompasses activating human T cells that recognize a human CYP1B1 epitope by any reasonable method. However, the only method steps described in the specification for activating the human T cells that recognize human CYP1B1 is by administering a CYP1B1 epitope. Considering the breadth of claim 27, the method encompasses administering molecules that can activate human T cells that recognize a human CYP1B1 epitope. This genus of molecules is indefinite in size, but could encompass thousands of different molecules, considering every molecule that could activate human T cells that recognize a human CYP1B1 epitope, including molecules that have yet to be identified.

Applicants respectfully traverse the rejection in view of the claim amendments and the following comments.

As amended, independent claim 27 is directed to a method for activating T cells in a subject, the method comprising administering to the subject an amount of a cytochrome P450 CYP1B1 sequence effective to activate T cells that recognize a CYP1B1 epitope. The amendments to the claim require that the activation of T cells in the subject be achieved by administration of a cytochrome P450 CYP1B1 sequence to the subject. The specification as filed clearly states that "[t]he activation of the immune system can be achieved by immunisation with CYP1B1 sequences" (specification at page 4, lines 20-24).

To satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention at the time the application was filed. The written description requirement is intended to (i) compel an applicant to clearly convey in the patent specification that the applicant invented the subject matter that is claimed, and (ii) put the public in possession of the claimed invention. The written description requirement ensures that a patentee adequately describe the invention in the patent specification in exchange for the right to exclude others from practicing the invention for the duration of the patent's term.

The currently claimed methods are based, at least in part, upon applicants' experimental findings that CYP1B1 was expressed in a wide range of tumors, but was not expressed in normal tissues tested (see specification at page 2, lines 30-31 and Table 1 on page 16). It was based upon this discovery of tumor-specific expression that applicants concluded that CYP1B1

sequences can be used to activate the immune system of a subject to generate T cells that recognize CYP1B1 (e.g., resulting in activated T cells that recognize CYP1B1-expressing tumor cells). The currently claimed methods encompass the use of any effective CYP1B1 sequence for generating an appropriate immune response. The person of ordinary skill in the art would understand that, because CYP1B1 is specifically expressed in tumors, applicants' invention is not limited to methods that use specific CYP1B1 sequences for generating an immune response. Rather, it follows from applicants' characterization of the expression patterns of CYP1B1 that any CYP1B1 sequence that generates an appropriate immune response can be used for the treatment of certain cancers. The specification thus clearly conveys that applicants invented the currently claimed methods.

In light of these comments and the claim amendments, applicants respectfully request that the Examiner withdraw the rejection of claims 27-35.

35 U.S.C. §112, First Paragraph (Enablement)

At pages 6-11 of the Office Action, the Examiner rejected claims 27-35 as allegedly not enabled. According to the Examiner,

> it is evident that the skilled artisan, while acknowledging the significant potential of immunotherapy for cancer, still recognizes that such therapy is neither routine nor wholly accepted. Furthermore, significant development and further guidance is necessary for its practice. Therefore, it is incumbent upon applicants to provide sufficient and enabling teachings within the specification for the instant methods. . . .
>
> Considering the high degree of unpredictability of cancer immunotherapy recognized in the art, the breadth of the claims, the lack of working examples and guidance in the specification, and the high degree of skill required, it is concluded that the amount of experimentation required to perform the broadly claimed invention is undue.

Applicants respectfully traverse the rejection in view of the claim amendments and the following comments.

As detailed above, amended independent claim 27 is directed to a method for activating T cells in a subject, the method comprising administering to the subject an amount of a

cytochrome P450 CYP1B1 sequence effective to activate T cells that recognize a CYP1B1 epitope.

As detailed in the working examples contained in the application as filed, the currently claimed invention is based, at least in part, upon applicants' discovery that CYP1B1 is expressed in a wide range of tumors but not in the normal tissues that were tested (see specification at page 2, lines 30-31 and Table 1 on page 16). As a result of this marked preferential expression of CYP1B1 in tumors, the specification teaches that CYP1B1 sequences can be used to immunize a subject, thereby resulting in activated T cells that recognize a CYP1B1 epitope and mediate an immune response against a CYP1B1-expressing tumor (see specification at page 4, lines 20-24). Because of the applicants' experimental findings clearly showing that CYP1B1 is expressed in many types of cancers, but not expressed in those normal tissues studied, the person of ordinary skill in the art at the time of filing of the present application would have reasonably expected that CYP1B1 sequences could be used to generate an effective immune response against CYP1B1-expressing tumor cells.

With respect to the Examiner's comments regarding the Wands factors, the claims have been amended by the present response to require the administration of a CYP1B1 sequence that activates T cells that recognize a CYP1B1 epitope ("breadth of the claims"). The amended claims thus do not encompass the use of "any compound" that can activate human T cells. In addition, the striking experimental findings (contained in the application) of tumor specific expression of CYP1B1 would have caused the skilled artisan to reasonably expect that CYP1B1 could be used effectively as the target of a cancer immunotherapeutic composition ("working examples and guidance in the specification"). As a result of these teachings, and without the need for a working example describing the treatment of a subject with a CYP1B1 sequence, the person of ordinary skill in the art would have been able to carry out the claimed methods without undue experimentation and with a reasonable expectation of success.

In light of these comments and the claim amendments, applicants respectfully request that the Examiner withdraw the rejection of claims 27-35.

CONCLUSIONS

Applicants submit that all grounds for rejection have been overcome, and that all claims are in condition for allowance, which action is requested.

Enclosed is a Petition for Three Month Extension of Time and a check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050, referencing Attorney Docket No. 12489-003002.

Respectfully submitted,

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